



Ø BEAT



COLO. SPRINGS,
COLORADO

JANUARY 1980

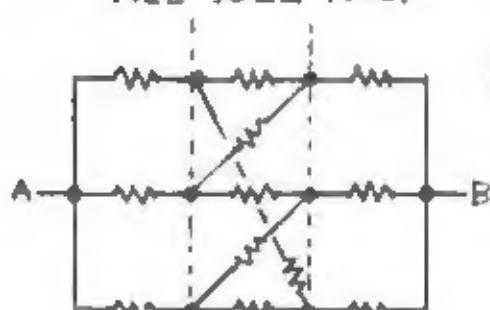


WHEELCHAIR HAMS

At the invitation of the Colorado Springs Steamroller Wheelchair Basketball Team, the PPRAA fielded an ace team of shooters in a game at North Jr. High on December 5. Of course we had to play in chairs too. What a ball! Those of us unable to walk and chew gum at the same time had much trouble handling the chair and playing ball too. This problem notwithstanding, the game tipped off on time. We even thought we had a chance when we scored first and trailed at halftime by only 18-14.

Soon we found out that their best players were on the bench, and we were literally knocked out of our chairs in the second half. Final score 40-19 Steamrollers. It looks like this madness could become an annual affair and we're looking forward to it. Thanks for the good time Dennis and all. Thanks also to the hams who made it possible.

ALL 10 Ω RES.



$$\frac{R}{3} + \frac{R}{6} + \frac{R}{3} = 8.33\Omega$$

Answer to
December Puzzle

P.P.R.A.A. DIRECTORS

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V. PRESIDENT	*Dave Vierling N0DV 2511 N. Tejon 80907	473-0293
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Board Member	Art Mayer WA0AEH 3032 Drakestone Dr. 80909	.635-7223
Board Member	*Ray Uberecken AA0L 9635 Thoroughbred Ln. 80908	.495-3544
Board Member	*Charleen Colvin WB0YOB 4610 Topaz 80918	.598-7704

(* Two-year board terms began November 1979)

ZERO BEAT is published monthly in the interest of the members of the Pikes Peak Radio Amateur Association, Inc., Colorado Springs, CO. Permission is given to reprint articles or excerpts provided credit is given. Deadline for submission of articles to be published is the third week of the month. Classifieds accepted anytime.

The Pikes Peak Radio Amateur Association meets on the second Wednesday of every month at Sabin Jr. High School, 3605 N. Carefree Circle at 7:30 p.m. and all amateurs and interested persons are cordially invited. The Association also conducts an informal net on all Wednesday evenings, except meeting night, on 146.52 MHz FM at 7:00 p.m.

Editor: Jim Colvin N0AVY, 4610 Topaz, Colorado Springs, CO 80918 598-7704

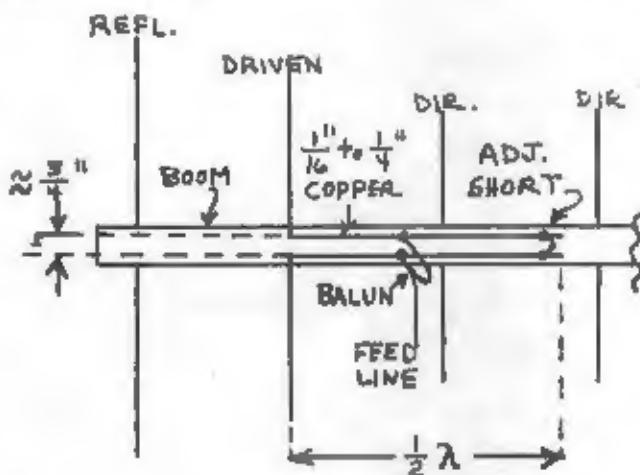
ARRL BULLETIN NR 122 FROM ARRL HEADQUARTERS NEWINGTON CT DECEMBER 6, 1979 TO ALL RADIO AMATEURS BT

The World Administrative Radio Conference, meeting since late September in Geneva, has now finished its work, with favorable results for amateur radio. In the bands below 30 MHz, all present allocations are retained and there will be three new worldwide bands. They are 10.100 to 10.150, 18.068 to 18.168, and 24.890 to 24.990 MHz. In the 10 MHz band, amateurs will be allowed to operate if they do not cause harmful interference to fixed service stations operating in the band. Amateurs may be permitted in this shared band as early as January 1, 1982. The 18 and 24 MHz bands will be exclusive, but before amateurs may operate here the existing fixed service stations must be moved to new assignments elsewhere in the spectrum. This transition will occur between July 1, 1984, and July 1, 1989. Amateur operations will likely be allowed to commence sometime during that period. In most of North and South America, including the U.S. and Canada, amateurs will enjoy exclusive use of the bands 1.800 to 1.850 and 3.500 to 3.750 MHz, which are presently shared with other services. In both cases, the remainder of the band continues to be available on the present shared basis. There were no changes of the allocations at 7.000 to 7.300 MHz. Amateurs in Region 1 will have a new narrow, exclusive allocation in the 1.8 MHz band, 1.810 to 1.850 in most countries and 1.830 to 1.850 MHz in others. Above 30 MHz the amateur and amateur satellite services also did well. Several new amateur satellite allocations were made between 1260 MHz and 10.5 GHz, all on the condition that harmful interference is not caused to other services. They are 1260 to 1270 MHz, uplink only; 2400 to 2450 MHz; 3400 to 3410 MHz, limited to Regions 2 and 3; 5650 to 5670 MHz, uplink only; 5830 to 5850 MHz, downlink only; and 10.45 to 10.5 GHz. For the amateur service in Region 2, a new secondary, shared allocation was made at 902 to 928 MHz. The band segment 1215 to 1240 MHz was withdrawn from the amateur service to protect a new radionavigation satellite system from interference. No other changes in present allocations above 30 MHz should affect U.S. amateurs. Several new amateur and amateur satellite bands were designated in the largely unexplored spectrum above 40 GHz. January QST will have more information, and February QST will carry a comprehensive report of the conference and its results. AR

TECH TALK . . .

When building VHF and UHF antennas, particularly YAGIs, it is often desirable to incorporate an adjustable matching system to get the SWR on the line near unity. One of the easiest and best methods I have found is a device sometimes called appropriately a "Universal Matching Stub".

Construction of the matching system is quite simple as shown in the diagram.



Adjustment for minimum SWR:

1. put adjustable short at open end of line
2. put balun at approximately the center
3. measure SWR with the antenna pointing straight up into the sky and off the ground a few feet on a nonmetallic support (ladder).
4. move the balun in the direction of lowering SWR an inch or so
5. move the short in slowly observing the decrease in SWR.
6. Alternate steps 4 and 5 until minimum SWR is obtained.
7. I forgot to mention in step 3 to do this at the lowest possible power — we like our club members the way they are.

Remember when making SWR measurements always reset the forward power setting before taking a new SWR reading.

Happy antenna building
Ray AA0L

MEETING MINUTES

The December meeting of the PPRAA was called to order at 7:30 p.m., Wednesday, Dec. 12 by President Don Lohse KA0CHA.

Dennis, WB0YKH, thanked all club members who participated in the wheelchair basketball game. A certificate was presented to the club in appreciation by the Steamrollers. Introduction of members and guests followed.

Treasurer Dave WB0SDW reported a balance of \$210.13 with 77.55 in SERVCOM. Minutes were approved as printed in Zero Beat.

Chuck W0RNT spoke about the Xmas party at the Grain and Grape, and encouraged everyone to attend.

The third annual Santa Net, coordinated by Frank WB0PAJ was planned for Saturday Dec. 22, at 10:00 a.m. on 16/76. Oak K0ROL will be Santa with hams in all local hospitals' childrens Ward. All are invited to participate.

Next Board meeting is January 7, 1980 at 7:30 p.m. at Frank WB0PAJ's, Satellite Building, #208. Revision of the By-Laws will be discussed at the meeting. Everyone is welcome.

Classes are still running at North Jr. High, with both novice and upgrade currently being conducted.

Volunteers for the food concession at the Swap Fest were solicited, as were Net Control Stations for the Wednesday night net. Doug WB0MHP and Dave N0DV came forward.

An ARRL Bulletin listing new frequency allocations was read. See elsewhere this issue.

Art WA0AEH made comments concerning Zero Beat changeover, and gave credit to Dave WB0TAQ for good service to the club.

Bud WB0TIB is still looking for a new person to serve in the ARRL position of EC for El Paso and Teller counties. He will be wanting to leave the position early this year, so please, consider the job. Another ARRL opening exists for SCM for the Colorado Division. Bob, K0DJ elected not to seek reelection, so consider this job also.

Dave N0DV is in the process of putting together a couple of novice stations for people who get their novice but have no way to get on the air. If you have any contributions to the effort, see Dave.

The Olympic Committee contacted Frank WB0PAJ to please come up with a resume of our communications actions and other functions for use by Sports Festival Committees in other cities that may have no idea about how to do the communications right.

Tom N0BZ, President of PPFMA spoke again concerning the use and abuse of the 37/97 machine and how the Forest Service use permit needs to be reviewed regularly and a good record of public service is necessary to continue the permit.

The business meeting was adjourned at 9:05 p.m. and was followed by the "Home-Brew" presentations.

Respectfully Submitted,
Lorna WD0BTF

MEETING NOTICE

The Pikes Peak Radio Amateur Association will meet this month on January 9, 1980 at Sabin Jr. High and the program will be on Microwaves.



NOVICE — What Now?

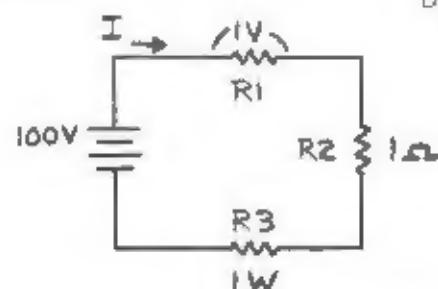
What's one of the most frustrating things about getting into ham radio? Certainly not the excitement of making the decision to become a ham, certainly not all the studying and questioning. After all that — what do you do? You pass the novice test and then — nothing. No rig! No Antenna! Not enough money!

P.P.R.A.A. has decided to try to eliminate this frustration by providing a loaner rig to deserving new hams for a short period of time so they can make those first all-important QSO's and get the true excitement of ham radio. We believe this will make the whole thing worth while and the fire won't ever go out.

To this end we are soliciting any used H.F. gear that can be put to use by a new ham. Just the basics, transmitters and receivers. A loan or gift of some of this equipment from your back room would be appreciated. We have people who can make repairs to slightly broken but otherwise serviceable rigs so don't let that stop you. Please think of the help you got as a new ham.

Again, don't let the no rig syndrome stop a new ham from participating in the excitement of ham radio. See what you can come up with and let me know, I'd be happy to pick it up.

— 73—
Dave N0DV
473-0293



FIND I, R1, R3

UNFINISHED BUSINESS

Swap Fest — At this writing we still need help — now gals we published some rather "broad" (pardon the pun) specification for someone to head up the food concession — the next time someone taps one of you on the shoulder you may be "IT."

A written outline for the organization and operation of the Sports Festival Communications (this was brought to light as WBOPAJ) — Frank was called by Baaron Pittinger for an outline of the organization and function of all groups. Frank had to call on his memory for this information and that's too much to ask of anyone. It would surely be an asset for a new Chairman or a ham group in another city to have a good outline of organization and procedure and also a few suggestions on possible problem areas. This can only enhance Amateur Radio in all circles. I suggest that a few key members of this last group undertake this effort.

Members At Large Note:

Certain members will be called upon personally to devote some time to writing articles for Zero Beat in some area of their expertise. Beware!!! and Be Ready —

Editor Says:

Another year has come and gone — the trials and tribulations and accomplishments are history. Now we look forward to a new year and a new decade. But lets review a little —

There are several outstanding accounts in my memory that truly spell out the creed and purpose of the Pikes Peak Radio Amateur Association. Not in this order but — The Walk for Mankind under the able leadership of KOTER — Mike Stansbury was an outstanding demonstration of public service. Amid the downpour members commandeered cars to get the walkers (mostly kids) back to their starting points and homes. Needless to say the communications were almost flawless.

The huge communications project of The Olympic Sports Festival '79 was the largest network of hams, outside a disaster ever assembled. WB0SSG — Dave Stivers and his crew more than met the task. The S2 net at the Academy was alive and buzzing from day one to the finals of the mens gymnastics smoothing out the ripples of a great national event. The 37/97 net in town kept the distant events under control and the 220 link tying the 2 net controls together made the entire 6 days truly a grand time to remember.

A real fun trip for the members participating was the Pikes Peak or Bust Enduro. 100 plus miles of trails back in hills were covered by our hams giving communications to a great crazy bunch of bike riders trying very hard to maim body and limb. This was truly a fun event for us, notwithstanding guiding the doctor to an injury back in the remote wilds of the course.

The Gazette Telegraph 10 mile run was an event of a 1000 plus runners and covered by our guys.

Other endeavors include Teller County Hill Climb, Pikes Peak Sports Car Club Hill Climb, Corvette Club Hill Climb, and I'm sure I've missed one or two more.

Our own personal events include Field Day and the Swap Fest and last but not least The Christmas Party. So all in all a very eventful and fun packed year. Lets go for '80 —

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DECEMBER BOARD MINUTES

The board meeting was held December 3, 1979 at Dave Vierling's N0DV at 7:30 p.m.

A date for the Swap Fest was to be selected so that Ken Holloway could request one of the two hangers available. No definite date was set at the meeting as no one was sure of last year's date.

One estimate of insurance was presented, but was cost prohibitive. There will be a request for an insurance salesman at the next club meeting to give an estimate to the board.

Programs have been proposed for future club meetings. The January 9 program will be presented by a representative of Mountain Bell on the topic of microwaves. Future programs suggested included a talk on radio-controlled models (planes — cars — boats), Bob Shriner from Circuit Board Specialists, and a field trip in May to Ehrhorn in Penrose.

The board unanimously voted to donate \$20.00 to the Steamrollers Wheelchair Basketball team to help them defray expenses.

The nets that are available were discussed and will be published in an upcoming issue of Zero Beat.

Tom Toblassen N0BZ will come to the club meeting to express the purpose of the 37-97 repeater and to answer any questions. The Pikes Peak FM Association is encouraging the use of the repeater for public service.

It was decided to have the December business meeting first followed by the "home brew" display. The Christmas Party would also be announced again and people encouraged to attend.

Frank, WBOPAJ told of a phone call from Mr. Pittinger concerning communications for the National Sports Festival. Frank gave him all the information he could. There is a pos-

Board Minutes cont.

sibility that the festival may be in Colorado Springs again in 1981 and the NSF Committee wondered if the club would consider doing the communication again.

The Spring Spree has been moved to June and the organization committee would like hams to furnish communications again. There may be complications due to the other events to which the club is committed.

The Santa Net will be organized again this year with Oak KØROL as Santa. People are needed to work the hospitals. It was decided that 37-97 would be used with the permission of the PPFMA as it was a public service event. Frank WBØPAJ will organize it.

The board felt it would be worthwhile to organize a committee to make a formal presentation to the proper people at the Olympic Training Center proposing the use of a building on the OTC grounds for a club station and possibly a meeting place. The presentation would tell of the services and options the club could offer the OTC in exchange for the privilege of using a building.

Novice theory classes are being taught by Warren WBØSJR on Thursday and novice code by Jim NØAVY on Tuesday. Upgrade classes, coordinated by Al ADØZ also run Tuesday and Thursday, with theory Tuesday, code Thursday. Novice classes meet at 7:00 p.m., upgrades meet at 7:30 p.m. at North Junior High.

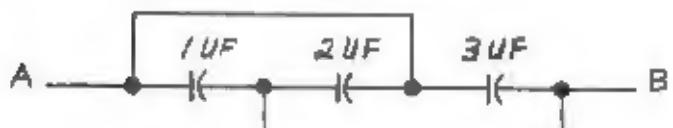
Lorna WDØBTB announced that there are 18 people in Woodland Park taking novice and upgrade classes.

Dave NØDV and Dave WBØSDW will build up or get sets for newly licensed novices to use so they can get on the air.

The school officials have informed Don KAØCHA that the club members must be out of the building by 10:00 p.m. on meeting nights. Also, pop, coffee, food, or smoking not allowed out of the lounge area.

The next board meeting will be on January 7, 1980 at Frank's WBØPAJ at the Satellite Hotel #208 at 7:30 p.m. This is an open meeting and members are invited to attend.

Respectfully Submitted,
Charleen WBØYOB



CAPACITANCE A To B ?

Editor, Zero Beat:

I feel a clarification of the recent change in editorship of the Zero Beat is in order, since any readers who noticed the change in the December issue will have no more idea than I had that any change had even taken place. I'd like to express my feelings on what happened in case anyone is interested in that.

A committee to "help Dave with Zero Beat" has been in the works for a long time. In recent months the number of board members interested in this has increased, and a man took the ball and has run with it. As a result, a week before the usual time for putting Zero Beat together I received a second-hand announcement that "They are going to put Zero Beat together in two days at so-and-so's house." That came as a surprise, and I wasn't even sure what it could mean. As I was unable to attend this last-minute meeting that I had nothing to do with setting up, I learned the results of the meeting as the

December issue appeared. On the front page was a letter from the editor, and another man's name appeared on page two as the editor. No announcement was made in the issue as to any change, rather, the club and board minutes both mentioned again the "committee to help Dave do Zero Beat." In an effort to find out where I stood I spoke with Don Lohse, who apologized profusely and said he had acted from reports that I didn't want to do Zero Beat anymore and that I was in full knowledge of what the committee was doing. He said I could certainly continue to be Editor, and that it was strongly hoped I would.

I also talked with Charleen and Jim Colvin. Jim said they thought I'd known about what was going on and that I was certainly welcome to have the title of Editor back and come and help the committee do Zero Beat. Thus I learned that Dave (along with anyone else in the club of course) was invited to help the committee that was to help Dave do the Zero Beat. The "Committee to help Dave with Zero Beat," I'm afraid, has never existed.

Still unsure what my role would be I came to the December club meeting and greatly appreciated what Art Mayer said regarding a grave error being made in identifying Jim as editor. At a time when another personal crisis had just hit my life, his words, and the warmth, compassion, and the feeling with which he expressed them, touched me deeply.

Then a man came and had lunch with me and I finally found out where I stood, and had been standing. I finally met the man who is running with the ball—and, as far as I can tell, the only one who has been able to come right out and tell me what the board members apparently have been saying among themselves regarding me and the Zero Beat. He said the board appreciated the thankless job I've been doing with Zero Beat, but that while Art Mayer may have spoken for himself, he did not speak for the board, who were in agreement that it was not a mistake to name Jim as the Editor—that it was, in fact, the plan. He proceeded to outline the reasons brought against me by the board which led to my "dismissal" as editor. That Zero Beat was being printed late, was skimpy, and that I as editor was not as involved with amateur radio as I once was and did not have enough visibility in the club or enough clout to hold people to the articles they'd promised so that Zero Beat would be thick.

Anyone knows these charges are true, and I don't mind taking the blame. You now have a Zero Beat with a lot of future ahead of it—more pages, more articles—and I finally, a month after it happened, have an explanation of what happened and why. The ball-carrier for Zero Beat has set out to do a job, and shows every indication that he will do it well.

But I, after three years of pouring heart and soul, (what little or much I had of either for any given issue) into Zero Beat, and making it my contribution (if my only contribution) to the club, must count myself the first casualty of the new Zero Beat. They have a great plan to give you a great paper, and I'm all for it and wish you all the best. Just one part of the plan didn't get executed — "who's going to tell Dave Allen?" Although I've been home more in the past six months than I've ever been in my life, my phone never rang. I am hurt. It's hard to be a part of something you've been so royally left out of. Last year's board was kind enough to give Carrie and me a wedding gift. I hope that under this year's board service to the club will not always be rewarded as it was for me.

Well, look, this is much longer than I intended it to be, but maybe you can just print it as one of those human interest stories. I feel an obligation to express to those interested why I am not editor of the paper.

*Dave Allen
WBØTAQ*

TECH TALK . . .

GRID-DIP METERS (Part 2)

In brief review of Part 1, a grid-dip meter is an oscillator with the tank coil exposed so that oscillator energy can be robbed. When this energy is robbed, the meter dips.

When is energy robbed from the grid-dip meter? The answer to this question is two-fold:

1. Whenever the grid-dip meter frequency is the same as the resonant frequency of an external circuit and;
2. Whenever the coil of the grid-dip meter is properly coupled to the inductive component of the circuit under test.

How do you use a grid-dip meter? Let us choose a common use for this answer. Suppose you want a dipole to properly resonate at 3.85 MHz and you know how to calculate the theoretical length by dividing 468 by 3.85 and you come up with 121.56 feet. You have a real good chance it will work properly, however, you have no SWR meter to check it with, but you do have a grid-dip meter.

When your dipole is cut and the center and end insulators are installed you would not usually raise the antenna without the feedline attached. For the sake of explanation we will raise it anyway so we can check the resonance. In order to do this you need to get yourself and the grid dip meter to the feed point of the dipole. The idea of this task is to see a dip in the meter when the dial of the grid-dip meter is set to (or moved slowly through) 3.85 MHz.

In order to accomplish this task you must connect a short piece of wire across the center insulator as shown in figure 1,

Short wire connecting each half of dipole



FIG. 1

The next step is to loosely couple the coil of the grid-dip meter to the center of the shorting wire. To explain "loosely couple", this means to move the coil just close enough to see the dip when resonance is reached. If the coil is too "tightly coupled" the grid-dip oscillator can be pulled off frequency enough to give you sizeable error in your measurement.

Another important and necessary bit of knowledge is how to properly orient the direction of the coil to the center of your antenna. Without going into the depths of magnetics to an engineering level, let us just accept an imaginary coil and its direction of turn on any piece of wire as shown in Figure 2.



FIG. 2

Now we have to couple the coil of the grid-dip meter to this imaginary coil on your wire. The best way to describe it is to have you look at Figure 3.

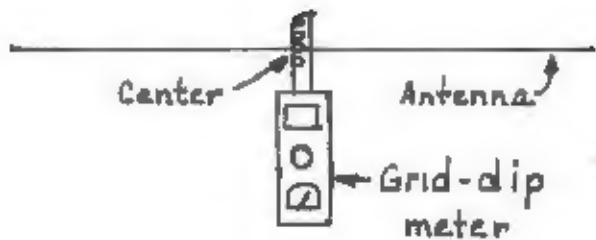


FIG. 3

Remembering there is an imaginary coil on this piece of wire, the end result of proper "direction" of coupling is shown in Figure 4.

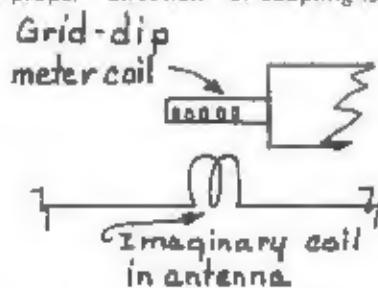


FIG. 4

Figure 5 illustrates the incorrect ways of coupling the grid-dip meter coil.

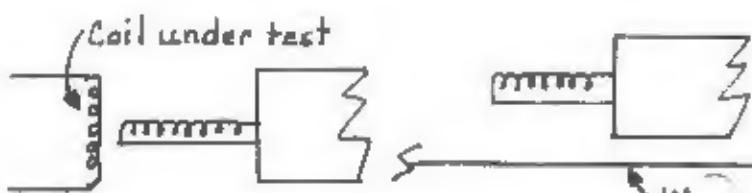


FIG. 5a

FIG. 5b

Now that you know "how" to do it, let us do it. Placing the coil perpendicular to the center of the antenna you move the dial of the meter slowly while observing the meter. The meter will be indicating somewhere above half scale (depending on the meter) when *not* at resonance. When resonance is reached you will see the meter indication drop. Wow! it seems to resonate at 3.65 MHz and the meter really dipped.

The first thing you say to yourself is "I cut it too long!" STOP! You have just experienced "tight" coupling. This is not all bad. Before dropping the antenna, move the dip-meter a little farther away and check it again. This time you notice it seems to resonate at 3.80 MHz and this dip isn't as great. The

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TECH TALK cont...

reason the first dip wasn't all that bad is because you have established the major dip. Continue moving the dip-meter farther away watching for a repeatable dip at the same frequency. You can move it far enough away until the dip lost completely. The last distance you were able to notice a dip is the most accurate. You have now established the true resonance of your dipole.

Remember when I made the statement "that a grid-dip meter can be a more accurate method of determining the resonance of an antenna than an SWR meter"? Well, you have just found that your dipole is resonant. Suppose you feed your dipole with a 300 ohm open line and you check the SWR. Surprise!! Your SWR is 4 to 1. "How can that be?" you say. To review impedances for a minute, the dipole has a feed impedance of approximately 75 ohms at resonance.

The 300 ohm feed line is 4 times the impedance of the antenna thus causing the high SWR. The antenna itself is not causing the 4 to 1 SWR.

Now, why do you go to the trouble of using a grid-dip meter if you use a feed line with an impedance the same as your dipole? Wouldn't the SWR be 1 to 1 at resonance in this case? Yes, if you have established a couple of things. First, you have to establish the feed line is free of defects, for example; it is neither shorted or open; it is the same impedance as the transmitter output and antenna (which have to be the same); and that when transmitting, the transmitted field doesn't induce current into your feed line. "A lot of variables", you say!

So far you have fallen off the 60 foot ladder you rented for this measurement 3 times and your dip-meter is only calibrated for increments of 25 to 50 KHz per mark, you ask why you were crazy enough to read this article? Well, let me acquit myself of driving you to your doom.

Instead of raising your dipole without the feed line, raise it with the feed line connected making sure it is the proper 75 ohm impedance and it seems to have no defects. Now you can sit in your warm, safe(?) ham shack with your grid dip meter. Now you can make the same test, BUT, a word of caution! You may observe many dips when your feed line is connected. The main dip can still be found with reasonable accuracy, it should be the greatest dip.

Your next question is how do I couple the coil of the grid dip meter to your feedline? Since most of us use coaxial cable, lets discuss two ways using coax. First you can make a coil of a few turns of the center conductor and solder it to the shield as in Figure 6.

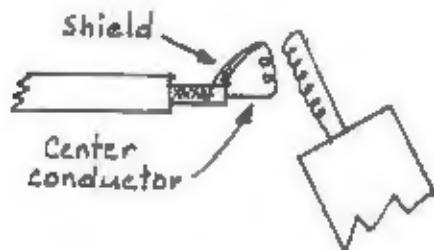


FIG. 6

You can then couple the grid-dip meter to the coil you have made. The second method of coupling the meter to the coax is to make a coil mounted to a female coax connector (UHF, BNC, etc.) as illustrated in Figure 7.

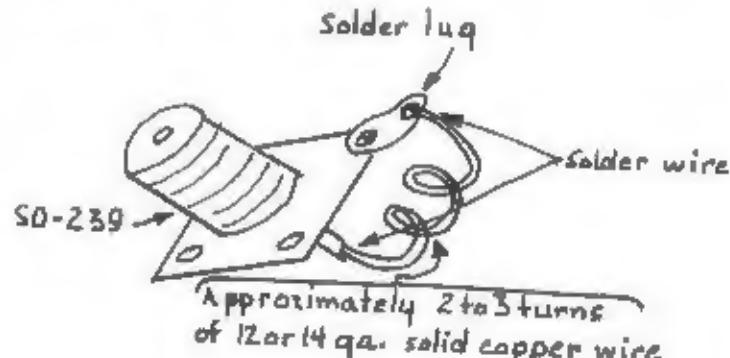


FIG. 7

Now you have both the necessary coupling coil and a way to connect it to your coax connector on the feed line. The same scheme can be used for BNC and "N" connectors as well.

So far we've discussed using the grid-dip meter in determining the resonance of a dipole and the ways to couple the dip meter.

The last comment in this month's discussion is resolving the dial accuracy of the dip-meter. Since you moved to your ham shack, you probably have a decent receiver next to you. During your endeavor to find the dip, you can use your receiver to find the output frequency of the dip meter and I'll bet it's dial accuracy is far better than the meter. So when you find the dip and zero beat your receiver to the grid-dip meter frequency, you know the resonant frequency of your antenna to within 5 or 10 KHz.

Since grid-dip meters are so versatile, there is no way to talk about it all in just two issues of Zero Beat, I'll start now on part III for next month.

73's Doug Moloney
WB0MHP

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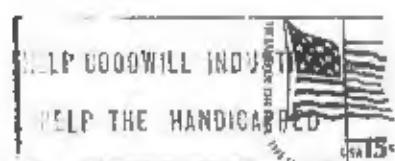
Type of membership Regular — \$6 Family — \$2 per member
w/Regular membership Associate — \$4



Ø BEAT



COLO. SPRINGS,
COLORADO



Jim Colvin NQAVY
4610 Topaz
Colorado Springs, CO 80918

FIRST CLASS MAIL

POW
SCHAARSCHMIDT WOOTZ
STEVE SCHAARSCHMIDT K0CI
2208 E GREENWICH CIR
COLO SPRGS, CO 80909